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EXAMINER	
KAUSHAL, SUMESH	

ART UNIT	PAPER NUMBER
1636	

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/605,042	WU ET AL.	
	Examiner	Art Unit	
	Sumesh Kaushal Ph.D.	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,7-10,12-16,25,28,29,31-42,44 and 46-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,7-10,12-16,25,28,29,31-42,44 and 46-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicant's response filed on 12/09/03 has been acknowledged.

Claims 2-6, 11, 17-24, 26-27, 30, 43, 45 are canceled.
Claims 48-55 are newly filed.
Claims 15, 25, 28-29, 31, 33, 38, 41 44 are amended.
Claims 1, 7-10, 12-16, 25, 28-29, 31-42, 44, 46-55 are pending and are examined in this office action.

*Applicants are required to follow Amendment Practice under revised **37 CFR §1.121**. The fax phone numbers for the organization where this application or proceeding is assigned is **703-872-9306**.*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The references cited herein are of record in a prior Office action.

Double Patenting

In response to applicant's response and the amendment that limits the scope of previously rejected claims to "uromodulin promoter" the double patenting rejection over US 5824543, US 6001646 and US 6339183 has been withdrawn.

Claim Rejections - 35 USC § 112

Claims 41 and 55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement (**new matter issues**). The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 41 recite a newly claimed limitation "*pig.... uromodulin promoter*". The applicant fails to point out where in the specification there is support for this claim limitation.

Claim 55 recite a newly claimed limitation "*uromodulin promoter directs expression of said heterologous polypeptide in-vivo in the thick ascending limb of Henle's loop and early distal tubules of the kidneys*". The applicant fails to point out where in the specification there is support for this claim limitation.

Claims *1, 7-10, 12-16, 25, 28-29, 31-42, 44, 46-55* are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The scope of the instant invention encompasses an isolated DNA molecule comprising a uromodulin promoter obtained from any and all organisms (i.e. frog, lizard, mouse, elephant monkey etc). At best the specification as filed only disclosed mouse and goat uromodulin promoter. The specification fails to disclose uromodulin promoter obtained form other animals like cow, sheep and pig etc.

The scope of the instant invention further encompasses non-human transgenic mammals selected from group consisting of goat, sheep, cow, pig and mouse encoding a uromodulin promoter that directs the expression of a heterologous polypeptide in the urine. At best the specification only disclose a transgenic mouse wherein the uromodulin promoter has been operatively linked to the human growth hormone coding sequences (spec. page 48, example-3). The specification further discloses two founder mice, which excrete hGH in their urine (page 51, lines 12-19).

Response to arguments

Regarding the **scope of kidney specific promoter**, the applicant argues that in the recent amendment the claims have been amended to recite "uromodulin promoter". The applicant argues that the sequences of the mouse and goat uromodulin promoters are disclosed in the specification. Furthermore, the bovine and rat uromodulin promoter regions have already been identified in the prior art, which has been incorporated in the specification by reference.

However, this is found NOT persuasive. Beside the mouse uromodulin promoter comprising the nucleotide sequences of SEQ ID NO:1, the specification as failed fails to disclose any other uromodulin promoter or fragment thereof that directs the expression of a polypeptide in-vivo in the kidney to produce the polypeptide in the urine. The state of the art regarding the urine-based bioreactor system, the art the time of filing teaches that the function of mammalian kidney is complex wherein the excretion of a gene product of interest in kidney can only be achieved by gene expression in the ascending limbs of Henle' sloop in kidney. Furthermore only the modified uromodulin promoter that contains exon 1 and a part of exon 2 has been known to provide kidney specific expression of reporter gene in transgenic mice that leads to production of the recombinant protein in urine (Zbikowska et al Biochem J 365:7-11, 2002, see abstract, page 7 col.1).

Applicant is referred to the guidelines for ***Written Description Requirement*** published January 5, 2001 in the Federal Register, Vol.66, No.4, pp.1099-1110 (see http://www.uspto.gov). The disclosure of a single species is rarely, if ever, sufficient to describe a broad genus, particularly when the specification fails to describe the features of that genus, even in passing. (see In re Shokal 113USPQ283(CCPA1957); Purdue Pharma L. P. vs Faulding Inc. 56 USPQ2nd 1481 (CAFC 2000). In the instant case the specification only teaches murine, goat and bovine uromodulin promoter but fails to disclose uromodulin promoter sequences obtained from any non-mammalian species.

The possession may be shown by actual reduction to practice, clear depiction of the invention in a detailed drawing, or by describing the invention with *sufficient relevant identifying characteristics* (as it relates to the claimed invention as a whole) such that a person skilled in the art would recognize that the inventor had possession of the claimed invention. *See, e.g., Pfaff v. WellsElectronics, Inc., 525 U.S. 55, 68, 119 S.Ct. 304, 312, 48 USPQ2d 1641, 1647 (1998); Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406; Amgen, Inc. v. Chugai Pharmaceutical, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991).* In claims to genetic material, generic statement such as "vertebrate insulin cDNA" or mammalian insulin cDNA," without more, is not adequate written description of claimed genus, since it does not distinguish genus from others except by

function, and does not specifically define any of genes that fall within its definition, or describe structural features commonly possessed by members of genus that distinguish them from others; accordingly, naming type of material generally known to exist, in absence of knowledge as to what that material consists of, is not description of that material (*Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406).*

In the instant case the uromodulin promoter has been defined only by a statement of function that broadly encompasses a promoter that directs the expression of polypeptide in the kidneys to produce a recombinant polypeptide in the urine, which conveyed no distinguishing information about the identity of the claimed DNA sequence, such as its relevant structural or physical characteristics. Beside the mouse uromodulin promoter comprising the nucleotide sequences of SEQ ID NO:1, the specification as failed fails to disclose any other uromodulin promoter or fragment thereof (obtained from any amphibian, reptile, bird or all mammal) that directs the expression of a polypeptide in-vivo in the kidney to produce the polypeptide in the urine. According to these facts, one skill in the art would conclude that applicant was not in the possession of the claimed genus because a description of only one member of this genus is not representative of the variants of genus and is insufficient to support the claim.

Regarding the **scope of transgenic animals** the applicant argues the specification disclosed that farm animals such as pigs, sheep, goats, horses and cattle may be used as the transgenic kidney-based urinary bioreactor of the present invention. The applicant argues that there is no requirement that a single non- human transgenic mammal comprising all the components and embodiments of the present invention be actually obtained. The applicant argues that the prophetic examples are certainly acceptable.

However, applicant's arguments are found NOT persuasive because the disclosure of a single species is rarely, if ever, sufficient to describe a broad genus, particularly when the specification fails to describe the features of that genus, even in passing. (see In re Shokal 113USPQ283(CCPA1957); Purdue Pharma L. P. vs Faulding Inc. 56 USPQ2nd 1481 (CAFC 2000). Applicant is referred to the guidelines for *Written*

Description Requirement published January 5, 2001 in the Federal Register, Vol.66, No.4, pp.1099-1110. In analyzing whether the written description requirement is met for the claimed invention, it is first determined whether a claimed genus have been described through sufficient description of a representative number of species by their complete structure and function. Although, it is not realistic to expect that the "complete structure" of an animal, or even a cell, could be described, the phenotype a transgenic animal with desired traits remains unpredictable phenomenon because it is the result of a complex interaction between animal genetics and environment. Therefore, the inquiry required by this portion of the written description guidelines is interpreted to be whether the phenotypic consequences of altering the genotype have been described. According to these facts, one skill in the art would conclude that applicant was not in the possession of the claimed genus because a description of only one member of this genus is not representative of the variants of genus and is insufficient to support the claim.

Claims 1, 7-10, 12-16, 29, 31-37, 47 and 55 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a DNA molecule comprising a mouse uromodulin promoter comprising the nucleotide sequences of SEQ ID NO:1 wherein the mouse uromodulin promoter directs the expression of the polypeptide in-vivo in the kidneys to produce the recombinant protein in the urine, does not reasonably provide enablement for a DNA molecule comprising any uromodulin promoter obtained from any and all organisms, wherein the uromodulin promoter directs the expression of the polypeptide in-vivo in the kidneys to produce the recombinant protein in the urine,. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Nature Of Invention:

The instant invention relates to a DNA molecule comprising a uromodulin promoter, wherein the uromodulin promoter directs the expression of the polypeptide in-vivo in the kidneys to produce the recombinant protein in the urine.

Breadth of Claims and Guidance Provided in the Specification

The scope of uromodulin promoter encompasses a uromodulin promoter DNA sequence obtained from any and all organisms. The specification teaches that uromodulin is a kidney specific promoter (spec. page 16, line 21-27). The specification as filed further disclosed the isolation of mouse and goat uromodulin promoter sequences. Besides mouse and goat uromodulin promoter sequences the specification as filed fails to disclose uromodulin promoter sequences isolated from any other organism like amphibians, reptiles, birds and all mammals

State Of Art And Predictability

The state of the art regarding the urine-based bioreactor system, the art the time of filing teaches that the function of mammalian kidney is complex wherein the excretion of a gene product of interest in kidney can only be achieved by gene expression in the ascending limbs of Henle' sloop in kidney. Furthermore only the modified uromodulin promoter that contains exon 1 and a part of exon 2 has been known to provide kidney specific expression of reporter gene in transgenic mice that leads to production of the recombinant protein in urine (Zbikowska et al Biochem J 365:7-11, 2002, see abstract, page 7 col.1).

Besides mouse uromodulin promoter comprising the nucleotide sequences of SEQ ID NO:1, the instant specification fails to disclose a uromodulin promoter or fragment thereof obtained form any other animal (amphibian, reptiles birds and all mammals) that directs the expression of a polypeptide in-vivo in the kidneys to produce the recombinant protein in the urine. Under the law, the disclosure "shall inform how to use, not how to find out how to use for themselves." See In re Gardner 475 F.2d 1389, 177 USPQ 396 (CCPA 1973). Therefore considering the limited guidance provided in the instant specification, it is unclear how one skill in the art would use the invention as claimed.

Claims *25, 28 38-42, 44, 46, 48-54* are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for transgenic mouse whose

germ cells and somatic cells contain a DNA molecule comprising a mouse uromodulin promoter (SEQ ID NO:1) operably linked to a fusion polypeptide comprising heterologous DNA sequence encoding a heterologous polypetide containing the uromodulin GPI sequences for apical surface membrane targeting sequence that directs the expression of a gene product of interest into the urine of the transgenic mouse, does not reasonably provide enablement for any non-human transgenic mammal selected from group consisting of goat, sheep, cow and pig whose germ or somatic cells contain a DNA molecule containing any uromodulin promoter and any and all non-native apical surface membrane targeting sequences, protease sensitive linkers, modified basolatral surface membrane targeting signals that directs the expression of a gene product of interest into the urine of the transgenic mammal. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention **commensurate in scope** with these claims, for the same reasons of record as set forth in the office action mailed on 02/27/03.

Nature Of Invention:

The invention relates non-human transgenic mammals that produce a biologically active recombinant polypeptide in the urine using a uromodulin promoter.

Breadth of Claims and Guidance Provided in the Specification

The scope of uromodulin promoter encompasses a uromodulin promoter DNA sequence obtained from any and all organisms. The scope of invention as claimed encompasses a transgenic goat, sheep, cow and pig whose genome or somatic cells contain a uromodulin promoter, any and all non-native apical surface membrane targeting sequences, any and all protease sensitive linkers, any and all protein having basolatral surface membrane targeting signals and a heterologous polypeptide sequence, wherein the mammal expression of a heterologous polypetide in the urine.
The specification teaches that uromodulin is a kidney specific promoter (spec. page 16, line 21-27). The specification as filed further disclosed the isolation of mouse and goat uromodulin promoter sequences. Besides mouse and goat uromodulin promoter sequences the specification as filed fails to disclose uromodulin promoter sequences isolated from any other organism like amphibians, reptiles, birds and all mammals.

Regarding transgenic animals the specification discloses a transgenic mouse wherein the mouse uromodulin promoter has been operatively linked to the human growth hormone coding sequences (see spec. page 48, example-3). The specification further discloses two founder mice, which excrete hGH in their urine (page 51, lines 12-19). The specification discloses the glycosyl phosphatidylinositols (GPI) sequences present in uromodulin gene that directs the expression of uromodulin to the apical surface membrane in kidney cells (page 27, lines 6-24). The specification further discloses that the PIPLC is the enzyme, which specifically cleaves the GPI linkage (page 30 lines 5-13). In addition, the specification characterized the Asn-lined glycosylation sites and GPI sites in rat mouse and human uromodulin amino acid sequences. Besides a transgenic mouse the specification fails to disclose a transgenic goat, sheep, cow or a pig whose genome or somatic cells contain a uromodulin promoter operably linked to gene product of interest, wherein the mammal express the gene product in the urine.

State Of Art And Predictability

The state of transgenic art at the time of filing was such that phenotype of an animal is determined by a complex interaction of genetics and environment. (Wood. Comp. Med. 50(1): 12-15, 2000, see page12). The phenotype examined in a transgenic and knock out model is influenced by genetic background, which is the collection of all genes present in an organism that influence a trait or traits. The genes may be part of same biochemical or signaling pathway or of an opposing pathway or may appear unrelated to the gene being studied. Furthermore, allelic variations and the interactions between the allelic variants also influence a particular phenotype. These epigenetic effects can dramatically alter the observed phenotype and therefore can influence or later the conclusions drawn form the transgenic or knockout models (Sigmund, Arterioscler. Throm. Vasc. Biol.20:1425-1429, 2000, see page 1425). The transgene expression and physiological consequences of transgene products in non-mouse mammals are not always accurately predicted among various species of mammals (Wall RJ Theriogenology 45:57-68, 1996). Transgene efficiency is low, and range from 1% in farm animals (cattle, sheep, pigs) to 3% in laboratory animals like rabbits, mice

and rats (Wall, see page 61). Furthermore, the lack of understanding of essential genetic control elements make it difficult to predict the behavior of a transgene in any and all animals because the expression is influenced by position effect in transgenic animals. The individual gene of interest, promoter, enhancer, coding or non-coding sequences present in the transgene construct and the site of integration, are the important factors that govern the expression of a transgene (Wall, page 61-62). The cis acting elements of one species may interact with different transactivating factors in other species. For example, the introduction of human growth hormone transgene in mice results in mammoth mouse phenotype, where as expression of the same transgene in pig results in premature death of transgenic pigs. (Pursel VG et al J. Reprod Fert. Sup 40: 235-245 1990, see page 235, para.1).

Furthermore, many biochemical pathways are plastic in nature, which reflects the ability of the embryo to use alternative gene when the preferred gene is modified. It is known in the art that the level and the specificity of a transgene as well as the phenotype of the transgenic animal are greatly dependent upon the specific expression vector used. The individual gene of interest, promoter, enhancer, coding or non-coding sequences present in the transgene construct and the site of integration, for example are the important factors that govern the expression of a transgene. (Kappel et al. Current Opinion in Biotechnology 3:558-553 1992; see page 550, col.1, para. 3-4, page 548, col.2 para.2). In addition considering the urine-based bioreactor system, the art the time of filing teaches that the function of mammalian kidney is complex wherein the excretion of a gene product of interest in kidney can only be achieved by gene expression in the ascending limbs of Henle' sloop in kidney. Furthermore only the modified uromodulin promoter that contains exon 1 and a part of exon 2 has been known to provide kidney specific expression of reporter gene in transgenic mice that leads to production of the recombinant protein in urine (Zbikowska et al Biochem J 365:7-11, 2002, see abstract, page 7 col.1).

Response to arguments

The applicant argues that even though genetic background can sometimes influence a particular phenotype, the presently claimed invention has very little to do

with phenotypic analyses of transgenic animals. Recombinant proteins are to be expressed under the control of the uromodulin promoter and secreted into the urine, where recombinant proteins have very little impact on animal phenotype. The applicant argues that if it is routine to obtain transgenic laboratory animals like rabbits, mice and rats with a transgene efficiency of 3%, then it would still be routine to obtain transgenic farm animals at a transgene efficiency of 1%. Even a single obtained transgenic farm animal is capable of producing a significant amount of a commercially desirable heterologous polypeptide.

However, this is found NOT persuasive because applicant's argument alone cannot take place of evidence lacking in the record. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). The scope of invention as claimed encompasses a transgenic goat, sheep, cow pig and mouse (or an ancestor of the animal) whereas the specification only disclosed a transgenic mouse with desired phenotype. The earlier office action has clearly provided the evidence that making a transgenic animal is highly unpredictable. Transgene efficiency in farm animals (cattle, sheep, pigs) is low (1%) and the lack of understanding of essential genetic control elements make it difficult to predict the behavior of a transgene in any non-mouse animals because the expression is influenced by position effect in transgenic animals. Furthermore, many biochemical pathways are plastic in nature, which reflects the ability of the embryo to use alternative gene when the preferred gene is modified. It is known in the art that the level and the specificity of a transgene as well as the phenotype of the transgenic animal are greatly dependent upon the specific expression vector used (supra). Furthermore making a transgenic animal from an ancestor would be highly unpredictable because an ancestor could be a distantly related species in this context (e.g. is buffalo is an ancestor of a cow ?). Considering the applicant's disclosure it is even unclear what are the ancestors of goat, sheep, cow or pig, making a transgenic embryo of which would result in development of goat, sheep, cow or pig. At issue, under the enablement requirement of 35 U.S.C. 1 12, first paragraph is whether, given the wands factors, the experimentation was undue or unreasonable under the circumstances.

"Experimentation must not require ingenuity beyond that to be expected of one of ordinary skill in the art." See Fields v. Conover, 443 F.2d 1386, 170 USPQ 276 (CCPA 1970).

Thus considering the unpredictability in the state of transgenic art and limited guidance provided in the instant specification to make a transgenic goat, sheep, cow or pig comprising a uromodulin promoter that directs the expression of a polypeptide of interest with further modification (as claimed) in the urine are not considered routine in the art and without sufficient guidance to a specific transgenic mammal the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). It is noted that the unpredictability of a particular area may alone provide reasonable doubt as to the accuracy of the broad statement made in support of enablement of claims. See Ex parte Singh, 17 USPQ2d 1714 (BPAI 1991).

Therefore, one skill in the art would have to engage in excessive and undue amount of experimentation to exercise the invention as claimed. i) The undue experimentation required would include making a transgenic goat, sheep, cow or pig wherein the uromodulin promoter directs the expression of gene of interest to the ascending limbs of Henle's loop in the kidney so that gene product can be secreted in the urine. ii) The undue experimentation required would further include the modification of the gene construct so that gene product of interest is effectively excreted from the apical surface membrane in kidney. iii) The undue experimentation required would further include the characterization of a polypeptide of interest for the presence of apical or basal sorting signals before making the recombinant DNA construct.

Claims 8 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention for the same reasons of record as set forth in the office action mailed on 02/27/03.

Claim 8 is indefinite because it is unclear what is "one or more non-native sites for glycosylation at predicted β-turns" in this context.

The applicant argues that the β-turns in the polypeptide can be predicted by Chou-Fasman algorithm or others commonly used in the art. However, this is found not persuasive because there is no support for such an assertion in the specification as filed.

Conclusion

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sumesh Kaushal Ph.D. whose telephone number is 571-272-0769. The examiner can normally be reached on Mon-Fri. from 9AM-5PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yucel Irem Ph.D. can be reached on 571-272-0781.

The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sumesh Kaushal
Examiner Art Unit 1636

JEFFREY FREDMAN
PRIMARY EXAMINER